

Mohib and series

Mohib() As we all known, is very brilliant in mathematics, his friend bar has given him another problem to solve. Bar gives him the sequence of distinct positive number, and then includes the number x in the sequence. The average of the numbers is avg . If bar removes the number x from the list, the new average is $avg+1$. He asked the Foo to tell him the largest possible number in the sequence.

Input

FirstLine contain number of testcases ($t \leq 5000$).

Next t lines contain the number $x(1 \leq x \leq 49999)$ and $avg(x+1 \leq avg \leq 50000)$.

Output

Print the largest possible number in the sequence.

Example

Input:

1

1 2

Output:

3